

WHAT IS CLAIMED IS:

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1. A method for manufacturing a semiconductor device comprising the steps of:

forming a semiconductor film on an insulating surface;
forming a semiconductor island having a tapered shape by patterning said semiconductor film, said tapered shape having an angle within a range of 20° to 50° between a side thereof and an underlying surface; and
irradiating a laser light to said semiconductor island.

2. A method according to claim 1, wherein said semiconductor film is crystalline semiconductor film.

3. A method according to claim 1, wherein said patterning is performed by an isotropic dry etching method.

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4. A method for manufacturing a semiconductor device comprising the steps of:

forming a semiconductor film on an insulating surface;
crystallizing said semiconductor film by heating;
forming a semiconductor island having a tapered shape by patterning the crystallized semiconductor film, said tapered shape having an angle within a range of 20° to 50° between a side thereof and an underlying surface; and
irradiating a laser light to said semiconductor island.

5. A method according to claim 4, wherein said heating is performed at a temperature of 550 to 750°C.

6. A method according to claim 4, wherein said patterning is performed by an isotropic dry etching method.

7. A method for manufacturing a semiconductor device comprising the steps of:
forming a semiconductor film on an insulating surface;
providing a crystallization promoting material onto said semiconductor film;
crystallizing said semiconductor film by heating;
forming a semiconductor island having a tapered shape by patterning the crystallized semiconductor film, said tapered shape having an angle within a range of 20° to 50° between a side thereof and an underlying surface; and
irradiating a laser light to said semiconductor island.

8. A method according to claim 7, wherein said heating is performed at a temperature of 550 to 750 °C.

9. A method according to claim 7, wherein said patterning is performed by an isotropic dry etching method.

10. A method according to claim 7, wherein said crystallization promoting material is selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, OS, Ir, Pt, Cu and Au.

11. A method for manufacturing a semiconductor device comprising the steps of:
forming a semiconductor film on an insulating surface;
crystallizing said semiconductor film by a first heating;
forming a semiconductor island having a tapered shape by patterning the crystallized semiconductor film, said tapered shape having an angle within a range of 20° to 50° between a side thereof and an underlying surface;
irradiating a laser light to said semiconductor island; and

forming a silicon oxide film on a surface of said semiconductor island by a second heating.

12. A method according to claim 11, wherein said first heating is performed at a temperature of 550 to 750°C.

5 13. A method according to claim 11, wherein said patterning is performed by an isotropic dry etching method.

14. A method according to claim 11, wherein said second heating is performed at a temperature higher than said first heating.

15. A method for manufacturing a semiconductor device comprising the steps of:

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forming a semiconductor film on an insulating surface;

providing a crystallization promoting material onto said semiconductor film;

crystallizing said semiconductor film by a first heating;

15 forming a semiconductor island having a tapered shape by patterning the crystallized semiconductor film, said tapered shape having an angle within a range of 20° to 50° between a side thereof and an underlying surface;

irradiating a laser light to said semiconductor island; and

20 forming a silicon oxide film on a surface of said semiconductor island by a second heating.

16. A method according to claim 15, wherein said first heating is performed at a temperature of 550 to 750°C.

17. A method according to claim 15, wherein said patterning is performed by an isotropic dry etching method.

18. A method according to claim 15, wherein said second heating is performed at a temperature higher than said first heating.

19. A method according to claim 15, wherein said crystallization promoting material is selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, OS, Ir, Pt, Cu and Au.

20. A method for manufacturing a semiconductor device comprising the steps of:

forming a semiconductor film on an insulating surface;
providing a crystallization promoting material onto said semiconductor film;
crystallizing said semiconductor film by a first heating;
forming a semiconductor island having a tapered shape by patterning the crystallized semiconductor film, said tapered shape having an angle within a range of 20° to 50° between a side thereof and an underlying surface;
irradiating a laser light to said semiconductor island; and
reducing said crystallization promoting material existing within said semiconductor island by a second heating.

21. A method according to claim 20, wherein said first heating is performed at a temperature of 550 to 750°C.

22. A method according to claim 20, wherein said patterning is performed by an isotropic dry etching method.

23. A method according to claim 20, wherein said second heating is performed at a temperature higher than said first heating.

~~24. A method according to claim 22, wherein said second heating is performed in an atmosphere containing halogen gas.~~

~~25. A method according to claim 22, wherein said crystallization promoting material is selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, OS, Ir, Pt, Cu and Au.~~

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